

## WHAT IS CLAIMED IS:

1. A semiconductor device, comprising:
  - a  $^{10}\text{B}$  diffusion layer containing an isotope  $^{10}\text{B}$  of boron introduced therein;
  - 5 a pn junction for detecting an  $\alpha$ -ray generated in said  $^{10}\text{B}$  diffusion layer; and
  - an analytic circuit for analyzing electric charge generated in said pn junction,wherein  
said  $^{10}\text{B}$  diffusion layer, said pn junction, and said analytic circuit are provided  
on a single semiconductor chip.
- 10 2. The semiconductor device according to claim 1, wherein  
a p-type diffusion layer for defining said pn junction is said  $^{10}\text{B}$  diffusion layer.
3. The semiconductor device according to claim 2, wherein  
15 said  $^{10}\text{B}$  diffusion layer is provide in a periphery of an upper surface of said  
semiconductor chip, and  
an n-type diffusion layer is provided under said  $^{10}\text{B}$  diffusion layer, said n-type  
diffusion layer defining said pn junction together with said  $^{10}\text{B}$  diffusion layer.
- 20 4. The semiconductor device according to claim 1, wherein  
said analytic circuit is arranged farther from said  $^{10}\text{B}$  diffusion layer than said  
pn junction.